MULTIMEDIA UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 3, 2022/2023**

## EEE 7316 – ENERGY POLICY, REGULATIONS AND STANDARDS

3 OCTOBER 2023
9.00 A.M. to 12.00 P.M.
(3 Hours)

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**INSTRUCTIONS TO STUDENTS**

1. This Question paper consists of 5 pages including cover page with 4 Questions only.
2. Answer ALL questions. The distributions of the marks for each question are as stated.
3. Please print all your answers in the Answer Booklet provided.

## Question 1

(a) One of the main reasons why the National Renewable Energy Policy and Action Plan (2009) was introduced is to resolve the implementation issues of Renewable Energy in the period of 2001-2008 in Malaysia.

(i) Explain THREE such issues. [6 Marks]

(ii) State THREE objectives of the National Renewable Energy Policy and Action Plan (2009). [3 Marks]

(iii) Provide THREE reasons why the policy is needed. [3 Marks]

(b) The National Energy Efficiency Action Plan (NEEAP) presents a strategy for implementation of energy efficiency measures in the industrial, commercial and residential sectors, which will lead to reduced energy consumption and economic savings for the consumers and the nation.

(i) Explain THREE barriers identified in NEEAP. [6 Marks]
(ii) Identify THREE key initiatives of NEEAP. [3 Marks]

(c) The National Energy Transition Roadmap was recently launched in 26$^{th}$ July 2023 to drive the National Energy Policy (2022-2040). State FOUR energy transition levers highlighted in the roadmap. [4 Marks]

**Continued...**

## Question 2

(a) Explain what is *energy conservation* and *energy efficiency*. Comment on whether they are the same or not.

[4 Marks]

(b) Distribution transformers generally have high efficiency of more than 90%. Yet, its losses are significant as they operate continuously throughout the year. Explain THREE measures that can be taken to minimize transformer losses.

[6 Marks]

(c) A factory has completed an energy audit. One of the findings of the audit is that the existing motors used are IE1 and it was recommended to replace them with High Efficiency Motors (HEM). Explain TWO possible reasons that such recommendation was made.

[6 Marks]

(d) Other than transformers and motors, name THREE electrical equipment which consumes significant amount of energy for industrial users. For each of the identified equipment, recommend TWO actions which can be taken to minimize energy losses. [9 Marks]

**Continued...**

## Question 3

(a) Explain what is *sustainable* energy. Then, explain how it can address *energy trilemma.* [9 Marks]

(b) GBI was launched by the Government of Malaysia to promote environmentally sustainable buildings. A company obtained GBI assessment scores as tabulated in Table Q4.

Table Q3

| Part | Item | Maximum Points | Score |
|---|---|---|---|
| 1 | Energy Efficiency | 35 | 25 |
| 2 | Indoor Environmental Quality | 21 | 15 |
| 3 | Sustainable Site Planning & Management | 16 | 14 |
| 4 | Material & Resources | 11 | 9 |
| 5 | Water Efficiency | 10 | 9 |
| 6 | Innovation | 7 | 6 |
| | Total Score | 100 | 78 |

(i) What is GBI? [1 Mark]

(ii) Name TWO other similar assessment tool used globally. [2 Marks]

(iii) What would be the rating that the company gets? [1 Mark]

(iv) Analyse the score in Table Q3. Then, suggest what can be done to improve the rating. [8 Marks]

(v) Building Energy Intensity (BEI) is a very important parameter in GBI. Explain what is BEI. [4 Marks]

**Continued...**

## Question 4

(a) You are appointed as a Registered Electrical Energy Manager (REEM) of a factory which uses boilers in its daily operation.

(i) What is the main reason of your appointment as a REEM by the factory?

[2 Marks]

(ii) Identify THREE responsibilities as a REEM.

[3 Marks]

(iii) Boilers are mechanical equipment which consumes significant amount of energy. Explain THREE measures which can be taken to ensure efficient operation of boilers in the factory.

[6 Marks]

(iv) As an Energy Manager, you are expected to be familiar with MS ISO 50001: Energy Management Systems. Briefly explain the six frameworks provided by MS ISO 50001.

[6 Marks]

(b) MS 1525: 2019 is a Malaysian Standard for energy efficiency and use of renewable energy for non-residential buildings.

(i) Buildings have a primary function to provide an internal environment suitable for the purpose of the building. State FOUR factors to be considered for passive design of a building to provide a good internal environment. [4 Marks]

(ii) Power factor for motors shall be corrected to better than the penalty threshold values (0.85 for Medium Voltage consumers and 0.90 for High Voltage consumers) when operating at duty point. Other than to avoid power factor penalty charges, explain TWO benefits of performing power factor correction. [4 Marks]

**End of the paper**